ABSTRACT OF THE DISCLOSURE

A plasma etching process, particularly useful for selectively etching oxide over a feature having a non-oxide composition, such as silicon nitride and especially when that feature has a corner that is prone to faceting during the oxide etch. A primary fluorine-containing gas, preferably hexafluorobutadiene (C_4F_6), is combined with a significantly larger amount of the diluent gas xenon (Xe) enhance nitride selectivity without the occurrence of etch stop. The chemistry is also useful for etching oxides in which holes and corners have already been formed, for which the use of xenon also reduces faceting of the oxide. For this use, the relative amount of xenon need not be so high. The invention may be used with related heavy fluorocarbons and other fluorine-based etching gases.